CLAIMS

1. An oligonucleotide comprising from about 2 to about 100 nucleotides and containing at least one unmethylated CpG dinucleotide.

2. The oligonucleotide of claim 1 which is represented by the following formula:

$$5' \quad X_1X_2CGX_3X_4 \quad 3'$$

wherein C and G are unmethylated, X_1, X_2, X_3 and X_4 are nucleotides and a GCG trinucleotide sequence is not present at or near the 5' and 3' termini.

3. The oligonucleotide of claim 2 having a phosphate backbone modification.

4. The oligonucleotide of claim 3 wherein the phosphate backbone modification is a phosphorothioate backbone modification.

5. The oligonucleotide of claim 4 comprising the following nucleotide sequence:

5' GGGGTCAACGTTGAGGGGGG 3' (SEQ ID NO:1)

6. The oligonucleotide of claim 5 having a phosphate backbone modification.

7. The oligonucleotide of claim 6 wherein the phosphate backbone modification is a phosphorothioate modification.

8. An oligonucleotide delivery complex comprising the oligonucleotide of claim 1 and a targeting means.

9. An oligonucleotide delivery complex of claim 8, wherein the targeting means is selected from the group consisting of cholesterol, virosome, liposome, lipid, a target cell specific binding agent

10. A pharmaceutical composition comprising the oligonucleotide of claim 9 and a pharmaceutically acceptable carrier.

11. A pharmaceutical composition comprising the oligonucleotide of claim 2 and a pharmaceutically acceptable carrier.

12. A method for activating a subject's B cells comprising contacting the B cells with an effective amount of the oligonucleotide of claim 1.

13. A method for activating a subject's B cells comprising contacting the B cells with an effective amount of the oligonucleotide of claim 2.

14. A method for activating a subject's natural killer cells comprising contacting the natural killer cells with an effective amount of the oligonucleotide of claim 1.

15. A method for activating a subject's natural killer cells comprising contacting the natural killer cells with an effective amount of the oligonucleotide of claim 2.

16. A method for treating, preventing or ameliorating an immune system deficiency in a subject comprising administering to the subject an effective amount of a pharmaceutical composition of claim 10.

17. A method for treating, preventing or ameliorating an immune system deficiency in a subject comprising the steps of:

a) contacting lymphocytes obtained from the subject with a composition of claim 1 ex vivo, thereby producing activated lymphocytes; and

b) readministering the activated lymphocytes obtained in step a) to the subject.

18. A method for vaccinating a subject comprising administering to the subject a composition of claim 10 in conjunction with administration of a vaccine.

19. A method for treating a disease associated with an immune system activation in a subject comprising administering to the subject an effective amount of a neutral oligonucleotide alone or in conjunction with a pharmaceutically acceptable carrier.

20. A method of claim 19 wherein the disease associated with immune system activation is systemic lupus erythematosus.

30. A method of claim 19 wherein the disease associated with immune system activation is sepsis.

31. An improved method for performing antisense therapy comprising methylating CpG containing oligonucleotides prior to administration to a subject.

32. An improved method for in vivo diagnoses using oligonucleotide probes comprising methylating CpG containing oligonucleotides prior to administration to a subject

33. An oligonucleotide which is capable of interfering with the activity of viral or cellular transcription factors and containing a consensus immunoinhibitory CpG motif represented by the formula:

$$5'GCGXnGCG3'$$

wherein X = a nucleotide and n = in the range of 0-50.

34. An oligonucleotide of claim 33, wherein X is a pyrimidine.

35. An oligonucleotide of claim 34, wherein Xn is a CpG dinucleotide

36. A method for treating or preventing a viral infection in a subject comprising administering to the subject an immunoinhibitory oligonucleotide of claim 33.